



Implementation of Self-Management in Asthma Patients to Reduce the Frequency of Asthma Recurrence: *Systematic Review*

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KEYWORDS

Self-management, Reduction in frequency of asthma recurrence, Asthma, Randomized Control Trial, PRISMA.

ABSTRACT:

Introduction: Asthma is a chronic inflammatory disease characterized by narrowing of the airways and causing increased hypersensitivity with symptoms of coughing, shortness of breath, chest tightness and wheezing. The prevalence of asthma in Indonesia is 5% of the entire population in Indonesia, namely around 12.5 million asthma patients in Indonesia. Asthma symptoms that appear periodically and repeatedly include wheezing, shortness of breath, chest tightness and coughing, especially at night before dawn.

Objectives: The exclusion criteria in this systematic review are articles that were not published in international journals, articles that were not published in 2018-2023, articles that did not discuss self-management interventions using media, respondents aged 12-22 years, articles that were not full text, duplicate articles, non RCT designs, non scientific studies will be removed. Search results using the Google Scholar and PubMed databases contained 1,173 articles, then identification and screening were carried out, there were 8 articles that met the inclusion and exclusion criteria.

Methods: The article design used is a systematic review which refers to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The keywords used by the author in searching for articles include "Asthma And Self Management". The database search in this article was carried out in December 2023. The databases used were Google Scholar and PubMed. Article selection was carried out according to inclusion and exclusion criteria.

Results: The results of the critical appraisal showed that the eight articles were of good quality. Then the eight articles are presented in table form, the table contains the researcher's name and year, article title, method used, research objectives, intervention and results. The article is reviewed and reports the results of implementing self-management in asthma sufferers to reduce the frequency of asthma recurrence.

Conclusions: Based on the discussion of articles in this systematic review, the results show that self-management is able to have a very positive impact on asthma sufferers in reducing the frequency of asthma recurrence and is able to reduce treatment costs. Several studies have proven that self-management is able to reduce the frequency of asthma recurrence, but the time period of the research carried out by each researcher is different. The longer the time given to carry out the intervention, the more impact it will produce, namely reducing the frequency of asthma recurrence. The media used for self-management are the same, but the results of the intervention can be different.



1. Introduction

Asthma is a chronic inflammatory disease characterized by narrowing of the airways and causing increased hypersensitivity with symptoms of coughing, shortness of breath, chest tightness and wheezing (Rahmawati, Hilmi, & Salman, 2023). In 2018, WHO stated that the number of asthma patients in the world was estimated to reach 300 million people and it is estimated that this number will continue to increase every year. The prevalence of asthma in Indonesia is 5% of the entire population in Indonesia, namely around 12.5 million asthma patients in Indonesia. Based on survey results, the prevalence of asthma sufferers in Indonesia in 2018 amounted to 1,017,290 people, where asthma is in the top ten diseases of death and morbidity (Oktaviani & Sutrisna, 2021).

Asthma symptoms that appear periodically and repeatedly include wheezing, shortness of breath, chest tightness and coughing, especially at night before dawn (Rahman, Saha, & Ta'adi, 2019). Asthma can be caused by two factors, namely internal and external factors. Internal factors are caused by antigen-antibody reactions and living allergens such as dust, powder, animal dander, while external factors are caused by infection, namely influenza viruses, mycoplasma pneumonia, physical (cold weather, temperature changes), irritants such as chemicals, air pollution (Co, cigarette smoke, perfume), while emotional factors are fear, anxiety, tension and excessive activity (Syafriningrum & Sumarsono, 2023). Among several factors that cause asthma, there is the most dominant factor in asthma recurrence, namely exposure to allergens in asthma patients who have IgE problems related to allergies. Asthma sufferers need to carry out self-management to reduce the frequency of asthma recurrence (Niespodziana, et al., 2020).

Asthma self-management is a behavior carried out independently by sufferers to reduce the frequency of recurrence in asthma sufferers. The main aim of self-management is to improve the quality of life for asthma sufferers and for asthma sufferers to be able to carry out

daily activities without any obstacles when doing so (Dwipayanti & Siswanto, 2021). Self-management is used more often considering that asthma is a disease that is difficult to cure because there are several trigger factors that cause asthma to recur frequently (Dwipayanti & Siswanto, 2021)

This systematic review aims to determine the effectiveness of implementing self-management in asthma sufferers to reduce the frequency of asthma recurrence.

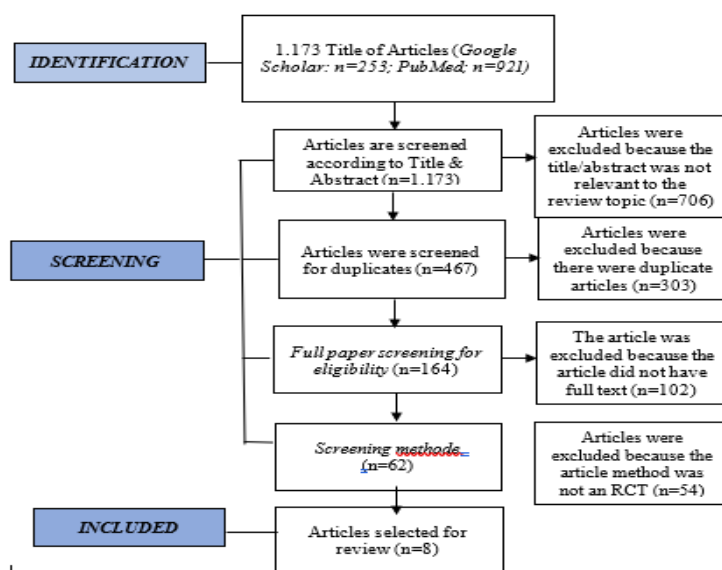
2. Objectives

The exclusion criteria in this systematic review are articles that were not published in international journals, articles that were not published in 2018-2023, articles that did not discuss self-management interventions using media, respondents aged 12-22 years, articles that were not full text, duplicate articles, non RCT designs, non scientific studies will be removed. Search results using the Google Scholar and PubMed databases contained 1,173 articles, then identification and screening were carried out, there were 8 articles that met the inclusion and exclusion criteria.

3. Methods

The article design used is a systematic review which refers to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The article search process begins by formulating PICO as the author's reference in finding the articles needed. The formulation of PICO in the systematic review is P: asthma patients, I: Self Management of asthma patients with games, C: no comparable intervention and O: reduces the frequency of recurrence in asthma sufferers.

The keywords used by the author in searching for articles include "Asthma And Self Management". The database search in this article was carried out in December 2023. The databases used were Google Scholar and PubMed. Article selection was carried out according to inclusion and exclusion criteria.



Picture 2.2 Diagram of Article Search Results Based on PRISMA 2020

4. Results

The articles selected through the identification and screening process resulted in a total of 8 articles, then the eight articles underwent a critical appraisal which assessed the suitability of the research with the methods used in the research. The instrument used to assess an article uses CASP JBI 2020 (Critical Appraisal Skills Program 2020). The method used in this systematic

review is a randomized controlled trial (RCT), there are 13 questions in the questionnaire to assess the level of quality of a study. The quality of an article is said to be good if the critical assessment results are 100-80%, it is said to be adequate, 79-50% and it is said to be less than <50%.

Table 3.1 Critical Appraisal Table

Writer and year	Critical Appraisal Checklist												
	1	2	3	4	5	6	7	8	9	10	11	12	13
(Landesberger, et al., 2023)	v	v	v	v	-	v	-	v	v	v	v	v	v
(Silberman, et al., 2022)	v	-	v	v	v	v	v	v	-	v	v	-	v
(Rhee, et al., 2021)	v	v	v	v	v	v	v	-	-	v	v	v	v
(Poowuttikul & Seth, 2020)	-	v	v	v	v	v	v	v	-	v	v	v	v
(Kohler, et al., 2020)	v	v	v	v	-	-	v	v	v	v	v	v	v
(Schneider, Baum, Amy, & Marisa, 2019)	v	v	v	v	-	-	v	v	v	v	v	v	v
(Sazlina, et al., 2019)	v	v	v	v	v	-	-	v	v	v	v	v	v
(Harris, Mosler, & Grigg, 2019)	v	v	v	-	v	v	v	v	v	v	-	v	v

The results of the critical appraisal showed that the eight articles were of good quality. Then the eight articles are presented in table form, the table contains the researcher's name and year, article title, method used,

research objectives, intervention and results. The article is reviewed and reports the results of implementing self-management in asthma sufferers to reduce the frequency of asthma recurrence.



Table 3.2 Article Summary Table

Witer and Year	Title	Method	Intervention	Hasil
(Landesberger, et al., 2023)	Conception And Pilot Testing Of A Self-Management Health Application For Patients With Pollen-Related Allergic Rhinitis And Allergic Asthma The APOLLO App	<i>Randomized Controlled Trial (RCT)</i>	The pollen data were obtained from the electronic pollen information network of Bavaria, Germany. Participants were asked to fill in their allergy-related complaints in the app over a 60-day period. Subsequently, the app was evaluated. Indices and diagrams visualized the participants' individual complaints as well as the daily pollen concentration in the air. In order to motivate participants to complete the app on a daily basis, we used elements of gamification	Two thirds of the participants (N=46) reported feeling better informed about pollen counts and their allergy when using the app. The app's simple and comprehensible design was rated positively. More than 80% of the participants would recommend the app to their family and friends
(Silberman, et al., 2022)	A Digital Approach To Asthma Self-Management In Adults: Protocol For A Pragmatic Randomized Controlled Trial	<i>Randomized Controlled Trial (RCT)</i>	24-month, decentralized, pragmatic, open-label, randomized controlled trial investigating the impact of a digital asthma self-management (DASM) program on asthma outcomes in adults. Participants are recruited (target N = 900) from throughout the U.S., and randomized to a DASM or control arm	Co-primary outcomes at one year are a) asthma-associated costs for acute care and b) change from baseline in Asthma Control Test™ scores. Findings may inform decisions around adoption of digital tools for asthma self-management.
(Rhee, et al., 2021)	Fidelity Of A Peer-Ied Asthma Self-Management Intervention And Its Attention Control In A Multi-Site Study Of Urban Adolescents	<i>Randomized Controlled Trial (RCT)</i>	Adolescents 12–17 years old (N = 259) in three cities in the United States received asthma self-management education implemented at a day camp, followed by bi-monthly, follow-up contact for 12 months. Thirty-five peer leaders and six adult educators implemented education sessions for the PLASMA and the attention control groups, respectively.	Most topics on asthma knowledge and skills (85–95%) were delivered as intended at an adequate pace in both groups. Peer leaders missed more content in the psychosocial domain than adult educators—14% vs. 0%, respectively ($t=-3.7$, $p=0.010$). PLASMA participants reported high content and time fidelity for all education sessions (94% to 97.6%). Greater success in bimonthly follow-up contacts was reported in the attention control groups, with 4.6 (± 1.5) contacts on average compared to 2.6 (± 2.02) in the PLASMA groups ($t=9.02$, p
(Poowuttikul & Seth, 2020)	New Concepts And Technological Resources In	<i>Randomized Controlled Trial (RCT)</i>		Mobile health applications can support asthma self management, improve a patient's quality of life,



	Patient Education And Asthma Self-Management			promote medication adherence, and potentially reduce the overall costs for asthma care. Inhaler trackers have shown to be beneficial to asthma outcome in various populations by improving adherence to asthma medications
(Kohler, et al., 2020)	An Internet-Based Asthma Self-Management Program Increases Knowledge About Asthma	<i>Randomized Controlled Trial (RCT)</i>	Patients randomized to the intervention group were asked to complete the eAEP by the end of their first week at the clinic. To this end, they were given access codes for use on the clinic's PC or on their own laptop. At the end of week 1 patients in the intervention group completed the AKT a second time. During weeks 2 and 3, all patients participated in the obligatory pAEP that formed part of the clinic's routine program	In the intervention group (n = 41), the AKT score increased from 41.57 (standard deviation 5.63) at baseline to 45.82 (3.84) after completion of the eAEP (p < 0.001), and again to 47.20 (3.78) after completion of the pAEP (p = 0.046). In the control group (n = 41), the score increased from 41.73 (4.74) at baseline to 45.72 (3.65) after completion of the pAEP (p < 0.001). There was no relevant difference in knowledge gain between the eAEP and the pAEP group after completion of the corresponding educational sessions (p = 0.881). The AKT score was higher in the eAEP group after obligatory participation in pAEP than in the group that only completed the pAEP (p = 0.020).
(Schneider, Baum, Amy, & Marisa, 2019)	I Have Most Of My Asthma Under Control And I Know How My Asthma Acts: Users Perceptions Of Asthma Self-Management Mobile App Tailored For Adolescents	<i>Randomized Controlled Trial (RCT)</i>	20 adolescents participated in a 3-month trial to test an asthma app tailored to their age. Qualitative data on adolescents' experience with the app were inquired	The majority expressed that the app assisted them with asthma selfmanagement through tracking of asthma status and text reminders to test their peak flow regularly. They indicated external factors that limited app use and suggested improvements to make the app more engaging and appealing to adolescents. The tested app provides a feasible means to assist adolescent in developing self-management skills, tracking disease status, and communicating with healthcare providers.



(Sazlina, et al., 2019)	Feasibility Of Supported Self-Management With A Pictorial Action Plan To Improve Asthma Control	<i>Randomized Controlled Trial (RCT)</i>	asthma control, assessed at 1, 3 and 6 months. Secondary outcomes included reliever use, controller medication adherence, asthma exacerbations, emergency visits, hospitalisations, days lost from work/daily activities and action plan use	About 84% (n = 59/70) completed the 6-months followup. The proportion achieving good asthma control increased from 18 (30.4%) at baseline to 38 (64.4%) at 6-month follow-up. The proportion of at least one acute exacerbation (3 months: % difference -19.7; 95% CI -34.7 to -3.1; 6 months: % difference -20.3; 95% CI -5.8 to -3.2), one or more emergency visit (1 month: % difference -28.6; 95% CI -41.2 to -15.5; 3 months: % difference -18.0; 95% CI -32.2 to -3.0; 6 months: % difference -20.3; 95% CI -34.9 to -4.6), and one or more asthma admission (1 month: % difference -14.3; 95% CI -25.2 to -5.3; 6 months: % difference -11.9; 95% CI -23.2 to -1.8) improved over time. Estimated savings for the 59 patients at 6-months follow-up and for each patient over the 6 months were RM 15,866.22 (USD3755.36) and RM268.92 (USD63.65)
(Harris, Mosler , & Grigg, 2019)	Theory-Based Self-Management Intervention To Improve Adolescents Asthma Control: A Cluster Randomised Controlled Trial Protocol	<i>Randomized Controlled Trial (RCT)</i>	an intervention comprising two components: (1) a theatre workshop for all children in years 7 and 8, and (2) self-management workshops for children with asthma. The COM-B model was used to guide the development of the intervention. Questionnaire data will be collected in schools at baseline, immediately post intervention, and 3, 6 and 12 months post intervention. The data collected at 6months will measure	The findings of the intervention will be submitted for presentation at national and international conferences. We will also seek to present our findings at local authority health and wellbeing boards

5. Discussion

Based on the results of a literature analysis of eight articles regarding the influence of self-management on

the frequency of asthma recurrence, it was found that self-management plays an important role in reducing the frequency of asthma recurrence, besides that self-



management can reduce the cost of treatment for asthma patients (Silberman, et al., 2022). Other research also states that self-management is easy to apply to friends or family who have asthma because the media used can be taken anywhere and can be used at any time. Self-management can increase family knowledge regarding self-management of asthma sufferers or the patient's family. This is proven by the results of more than 80% of respondents experiencing increased knowledge in carrying out self-management. Research (Poowuttikul & Seth, 2020) explains that self-management can make asthma patients independent in terms of avoiding agents that can cause asthma recurrence. This has been proven that the compliance of asthma sufferers in self-management has increased compared to before.

Research (Harris, Mosler, & Grigg, 2019) suggests that apart from increasing knowledge about self-management, self-management also improves the well-being of asthma sufferers resulting in a reduction in the frequency of asthma recurrence. Self-management needs to be done because there is a lot of information in it regarding the recommended time to take medication, what things need to be avoided, agents that trigger asthma recurrence and many other things that asthma sufferers or their families need to know.

What previous studies have in common with this systematic review is the application of self-management to intervene in patients with asthma. Self-management interventions have a positive impact on asthma sufferers because by carrying out this intervention there is a reduction in the frequency of asthma recurrence. In addition, it reduces the costs incurred to treat asthma. Another difference in the study was in the respondents or control group, where the results were different in adolescents and adults, but overall the results of the study were able to reduce the frequency of asthma recurrence.

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